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November 30. (Stated Meeting.)

Rev. B. LLOYD, D. D., Provost, T. C. D., President, in the Chair.

William E. Bolton, Esq. and Thomas F. Bergin, Esq. were elected Members of the Academy.

Sir William Betham exhibited to the Academy a specimen of the ancient brazen ring money, found in the county of Monaghan,* and also a piece of cast iron, found with many others, in boxes, on board a vessel wrecked on the coast of Cork last summer. This vessel was bound to Africa, where it is stated the pieces in question pass for money. They are so similar in shape and size to the ancient specimens, that there can be no reasonable doubt of the identity of their uses; and thus the theory advanced in the paper referred to is strongly confirmed.

Sir William Betham also read an extract of a letter from a friend, in which it was stated, that gold rings, exactly formed like those found in the Irish bogs,—that is, of gold wire turned into the form of rings, but not united at the ends,—pass current at this moment as money in Nubia and Sennaar.

The Dean of St. Patrick's exhibited two bronze specimens of the first mentioned articles found in Italy, one of which was encrusted with crystals of carbonate of lime.

The following papers were read:

1. "On the Affinity of the Hiberno-Celtic and Phœnician Languages." By Sir William Betham, M. R. I. A., Secretary of Foreign Correspondence.

In this paper the author undertakes to prove that the names of the divinities, heroes, and nymphs of the Greeks and Romans, are significant in the Hiberno-Celtic language;

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* See paper read 23rd May and 27th June, page 12.

that many of the ancient names of countries, seas, and places are also significant; and that the same thing is true of the names of the Etruscans and Pelasgi, as well as of the words of both these people which have come down to us in the Greek and Roman writers. From this he infers that the Pelasgi, the Etruscans, and the Celts were all colonies of the Phœnician people, and all spoke the language now called Gaelic or Hiberno-Celtic. He instanced the remarkable fact mentioned by Suetonius in his Life of Augustus Cæsar, (c. 97,) where, giving an account of the death of Augustus, and the omens which preceded it, he says:

"Sub idem tempus ictu fulminis ex inscriptione statuæ ejus prima nominis litera effluxit. Responsum est centum solos dies posthac victurum, quem numerum C litera notaret; futurumque ut inter deos referretur, quod ÆSAR, id est reliqua pars e Cæsaris nomine, Etrusca lingua *Deus* vocaretur."

Aoſaɼ is one of the Irish names for God, and not only is the word itself to be found in the Irish dictionaries and MSS. but it is compounded of two Irish words meaning *the eternal ruler*, or *ruler of ages:* aoſ, *ages*—aɼ, *ruler.*

The author gave many examples of the significance of the names of the Greek and Roman divinities, and also of the ancient names of countries, in the Hiberno-Celtic language; among them the following:

Aurora—the golden hour, or sunrise.
Bacchus—the lame drunkard.
Diana—the goddess.
Gorgones—the frightful women.
Haruspex—judging from a pang or throe.
Iris—the sun and the shower.
Neptune—the king of the waves.

The names of the Nereides denote the flitting aerial nymphs; the nymph of the sea weed; the silent nymph; the spark of the wave; the nymph of the deep water, the rock, the estuary, the storm, &c. &c. The word nymph also means the holy one, or one set apart.

Pluto—the miner, or one who lives in a cave.

Sesostris—the name applied to Rameses the Great by the Greeks,—implies the fortunate, scientific, and powerful prince.

Silenus—the staggering drunkard.

Venus—the woman of the community; the courtesan.

Of the names of countries:—

Abyssinia—the country of rain.

Ethiopia—the country of springs or wells.

Assyria—the old country of power.

Egypt—the cultivated valley.

The Euxine—the little sea.

The Adriatic—the sea of enchantment, &c. &c. &c.

The author affirmed that examples of this kind were so numerous and so striking, that it was impossible to ascribe them to accidental coincidence; and he inferred from all, that these names were given by the Phœnicians, and that the Hiberno-Celtic was the language spoken by that people.

2. "On the Propagation of Light in Uncrystallized Media." By the Rev. H. Lloyd, F. R. S., M. R. I. A., Professor of Natural Philosophy in the University of Dublin.

The objects of the author have been—1. to simplify and to develop that part of M. Cauchy's theory, which relates to the propagation of light in an ethereal medium of uniform density; 2. to extend the same theory to the case of the ether enclosed in uncrystallized substances, taking into account the action of the material molecules.

Some of the simplifications adopted in the first part of these inquiries suggest themselves naturally. Thus the *axes of symmetry* of the medium are taken as the axes of coordinates, and the direction of propagation is assumed to coincide with one of these axes. By these suppositions the differential equations of motion are reduced to a very simple form; and it is manifest that the assumptions themselves involve no real limitation of the problem. The well known expressions for the component displacements are deduced by the integration of these equations. The following is that in the direction of the axis of x:

$$\xi = a \cos(ut - kz + \alpha);$$

in which

$$u = \frac{2\pi}{\tau}, \quad k = \frac{2\pi}{\lambda},$$

τ being the period of vibration, and λ the length of the wave. These quantities are connected by a relation given by the method of integration.

The preceding formula, however, is not the most general form of the expression for the displacement. It is found that in certain cases the integral becomes

$$\xi = ae^{-hz} \cos(ut - gz + \alpha).$$

From this expression it follows that the amplitude of the displacement, and therefore the intensity of the light, decreases in geometrical progression, as the distance increases in arithmetical progression; and as the constant h is in general a function of u, or of the colour, the differently coloured rays will be *differently absorbed.* The complete value of ξ being the sum of a series of terms similar to the preceding, it is manifest that we have here a satisfactory account of the apparently irregular distribution of light in the absorbed spectrum. To explain the absolute deficiency of the light at certain points, it is only necessary to admit that the function h varies in certain cases *rapidly* with moderate changes in u, and becomes *very great* for certain definite values of that quantity.

The preceding integral has been already obtained by M. Cauchy, in a valuable memoir recently printed in lithograph. The method employed by the author seems, however, to be fundamentally different from that of M. Cauchy; and in fact he was led to this form of the integral by other considerations before he was aware that he had been preceded in the deduction.

The remainder of the present communication is taken up with the discussion of the relation between the coefficients u and k, which expresses the law of dispersion. Following M. Cauchy,* the author has transformed this relation by converting the triple sums into triple integrals; and he has found that, by applying this transformation at an earlier stage of the investigation, the resulting relation is deduced with great simplicity.

The relation between u and k, for the vibrations in the plane of the wave, has already yielded to M. Cauchy the probable result, that the molecules of the ether repel one another according to the inverse fourth power of the distance. When this law of force is substituted in the corresponding relation for the *normal* vibration, the author finds that the resulting value of $\frac{u}{k}$, or of the velocity of propagation, is infinite; so that the normal disturbance is propagated *instantaneously*, and gives rise to no wave. Thus the hypothesis of transversal vibrations seems to be established on theoretical grounds.

The author finally gives reasons for concluding that the theory, in its present form, is insufficient to explain the phenomena of light in bodies; and that it becomes necessary in this case to take into account the action of the material molecules. This extension of the theory will be given in a future communication.

3. "On the Composition of Thebaine." By Robert J. Kane, M. D., M. R. I. A., Professor of Natural Philosophy in the Royal Dublin Society.

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* Nouveaux Exercices de Mathematiques. Livraison 7$^{\mathrm{me}}$.

The author gave an account of the analysis of the vegetable alcaloid thebaine (paramorphine) which had been discovered in opium, and of which the analysis by Pelletier and Couerbe gave discordant results. With a specimen which had been prepared by Apothecary Merck of Darmstadt, Dr. Kane obtained the formula $C_{25} N_2 H_{28} O_3$, (Berzelian atoms,) and giving the per cent. composition:

25 Carbon	= 74,57	= 1910,925
2 Azote	= 6,89	– 177,036
28 Hydrogen	= 6,83	– 174,714
3 Oxygen	= 11,71	– 300,000
	100,00	2562,675

Owing to the circumstance of the salts of this base with the mineral acids being uncrystallizable, the atomic weight obtained by analysis could not be synthetically confirmed.

Professor Kane read likewise an extract of a letter from Professor Liebig, of Giessen, communicating some new results of chemical analysis.

It was resolved, on the recommendation of council, that the bye-laws relating to the meetings of the Academy and Council (Chap. IV. Sects. 2 and 6), be altered, and the following substituted :—

(2.) "That a General Meeting of the Academy shall likewise be held on the *second* Monday of November and December, and on the *second* and *fourth* Mondays of January, February, April, May, and June, at 8, P. M. At these Meetings, such communications as shall have been approved of by the Committees during the preceding part of the month, shall be read."

(6.) "That the Stated Meetings of the Council shall be held on the *first* and *third* Monday of every month, from November to June, inclusive; with power to adjourn, from time to time, at all times of the year. Five to be a quorum."

It was further resolved, on the recommendation of Council, that the "Proceedings of the Royal Irish Academy," be printed every month during its sittings, for the use of its members.

"The Proceedings" to be under the management of the Council, and to contain—

1. Abstracts of the larger papers read to the Academy.
2. Minor communications, not intended for the Transactions, printed more at length.
3. Notices of the election of Members, of presents received, and of all other matters of general interest transacted at the Meetings of the Academy.

DONATIONS.

A copy of the Ordnance Survey of the County of Donegal, in 112 sheets. Presented by Lieut. Colonel Colby.

Flora Batava, No. 107. By H. C. Van Hall. Presented by the Author.

Estatutos da Academia Real das Sciencias de Lisboa. Presented by the Society.

Der erste Unterricht des Taubstummen. Von M. C. G. Reich. Presented by Henry Holmes Joy, Esq.

Bliche auf die Taubstummenbildung. Von M. C. G. Reich. Presented by the same.

Astronomical Observations made at the Observatory of Cambridge, for the year 1835. By George Biddell Airy, Esq., Astronomer Royal. Presented by the Author.

Six lectures on the Wave-theory of Light. By the Rev. H. Lloyd, F. R. S., &c. Presented by the Author.

Reports of the Committee of the Franklin Institute on the Explosions of Steam Boilers: in two parts. Presented by the Franklin Institute of Pennsylvania.

Report of the Managers of the Franklin Institute, in relation to Weights and Measures. Presented by the same.

Observations to determine the Magnetic Dip at Baltimore, Philadelphia, New York, West Point, Providence, Springfield, and Albany. By A. D. Bache, Professor of Natural Philosophy and Chemistry, and Edward H. Courtenay, Professor of Mathematics, in the University of Pennsylvania. Presented by the former.

On the relative horizontal Intensities of terrestrial Magnetism at several Places in the United States. By the same.

Analysis of some of the Coals of Pennsylvania. By H. D. Rogers, F. G. S. London, and Professor Bache, &c. Presented by the latter.

Notes and Diagrams, illustrative of the Directions of the Forces acting at and near the Surface of the Earth, in different Parts of the Brunswick Tornado of June 19th, 1835. By A. D. Bache, Professor of Natural Philosophy and Chemistry in the University of Pennsylvania.

The same author presented also the following papers to the Academy:

Remarks on a Method, proposed by Doctor Thomson, for determining the Proportions of Potassa and Soda in a mixture of the two Alkalies.

Note relating to the hardening of Lime under Water, by the Action of Carbonate of Potassa, &c.

On the comparative Corrosion of Iron, Copper, Zinc, &c. by a saturated Solution of common Salt.

Memoir on the Elastic Force of the Vapour of Mercury at different Temperatures. By M. Avogadro. (Translated by Prof. Bache.)

An Essay on Chemical Nomenclature. By J. J. Berzelius. (Translated from the French, with Notes, by Prof. Bache.)

Historical Notes.

Note of the Effect upon the Magnetic Needle of the Aurora Borealis, visible at Philadelphia on the 17*th of May,* 1833.

Diagrams for illustrating a Register of the Direction of the Wind.

Experimental Illustrations of the radiating and absorbing Powers of Surfaces for Heat, &c.

Replies to a Circular in relation to the Occurrence of an unusual Meteoric Display on the 13*th of November,* 1834.

Notice of Experiments on Electricity developed by Magnetism.

Experiments on the Efficacy of Perkins's Steam Boilers, or Circulators.

On the alleged Influence of Colour on the Radiation of non-luminous Heat.

Safety Apparatus for Steam Boilers.

Observations on the Disturbance in the Direction of the horizontal Needle during the Aurora of July 10*th,* 1833.

Report of Experiments on the Navigation of the Chesapeake and Delaware Canal by Steam.